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ABSTRACT

An innovative classroom-based approach to reading instruction in the context of Spanish instruction was proposed. The effects of this instruction on the pronunciation ability of students were analyzed. The subjects were 30 adult missionary trainees who had no previous exposure to Spanish. The dependent variable was measured using two instruments. A posttest-only control group design was selected, using analysis of covariance, with Modern Language Aptitude Test scores as the covariate. Analysis of both dependent measures showed a significant treatment effect as well as a significant aptitude-treatment interaction. Results confirm Wilkinson's (1975) research regarding the improved effect on pronunciation ability of missionaries due to early reading instruction. Analysis of interaction showed reading instruction to be most beneficial to low-aptitude subjects, with high-aptitude subjects scoring more favorably overall. These findings suggest the need for the consideration of the presence of such an interaction in research evaluation. (Author/AH)

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THE EFFECT OF SPANISH CLASSROOM READING INSTRUCTION
ON PRONUNCIATION ABILITY DURING THE
FIRST WEEK OF INSTRUCTION

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Pronunciation is generally regarded as a critical component of second-language acquisition (Nida, 1957). Giles and Powesland (1975) cite a number of studies which demonstrate how social judgment is affected by a speaker's pronunciation. Research conducted by Piñon (1970) revealed that when secondary school students in Mexico rated unseen foreign speakers exclusively on their ability to pronounce Spanish, the speakers with good pronunciation were rated as being intelligent and well-born while the speakers with poor pronunciation were rated as being ignorant and unsophisticated. Such findings are particularly important to ambassadors, foreign service personnel, missionaries, etc. who are required to communicate to some degree in a second language.

Many applied linguists take the position that second language students can eventually achieve mastery of reasonably proper pronunciation, given enough practice of sufficient quality (Dalbor, 1969). Billows (1961) has calculated, for example, that "ninety percent of

the pupils in the average class can imitate pronunciation quite adequately if they have enough representative samples to hear" (p. 52). This position is not substantiated however, in the case of many Brigham Young University students who have returned from two-year mission assignments in Spanish speaking countries.

Although large scale surveys have not as yet been conducted to ascertain the pronunciation ability of return missionaries as they conclude their two year assignments in foreign countries, upper division Spanish professors at Brigham Young University have noted in many returned missionaries deficiencies in Spanish pronunciation skills. Other persons who are fluent in Spanish and sensitive to the pronunciation ability of returned missionaries confirm this opinion. The most alarming fact seems to be that although these missionaries have lived in Spanish speaking countries and have communicated in Spanish almost exclusively for two consecutive years, they have not been able to learn correct pronunciation from the thousands of hours of native modeling to which they have been exposed. Clearly, being adequately exposed to an appropriate model does not guarantee in this instance proper pronunciation.

The questions of how and when a student should receive instruction in improving pronunciation as part of his second language experience are extremely complex and far too broad to be answered within the scope of a single study. It is an issue, however, which has recently received some degree of attention in the case of the prospective missionary given Spanish second language instruction at the Language Training Mission on the Brigham Young University campus. (The Language

Training Mission, Provo, Utah, provides an eight week intensive Spanish second language experience for approximately twenty-five hundred LDS missionaries each year.) Wilkinson (1975) examined one alternative designed to improve the pronunciation ability of missionaries learning Spanish in the Language Training Mission (LTM). Missionaries who were identified by their LTM instructors as poor pronouncers of Spanish and as poor readers of Spanish through the use of a criterion-referenced reading skills test were randomly assigned to treatment groups. The missionaries in the experimental group received instruction from bilingual tutors using Lectura Inicial (Harrison, Ott and Tuttle, 1974), a tutorial program which is designed to teach two reading subskills, producing sounds and decoding. The results of this study demonstrated significantly better pronunciation ability of the experimental subjects who received tutorial reading instruction than the subjects in the control group who received no reading instruction.

Since Wilkinson (1975) utilized a particular tutorial reading program, the generalization of his research is restricted to reading instruction which is based on a tutorial delivery system similar to Lectura Inicial. However, a tutorial program which focuses on any aspect of second language instruction poses serious limitations due to logistical considerations and the low availability of trained bilingual tutors. For example, a tutorial approach comprising ten hours of instruction, which is administered to ten subjects, would necessitate ten tutors or the equivalent of one hundred man-hours of instructor time. In comparison, an alternative classroom approach of the equivalent ten hours of instruction, which is administered

to a class of ten subjects, would necessitate only one instructor or ten man-hours of instructor time; a significant reduction over the tutorial approach. For this reason, it is felt that if classroom reading instruction could provide similar results in significantly enhancing pronunciation within a comparable instructional period, such an approach would provide a viable solution to the restrictions imposed by general tutorial approaches. Perhaps as important as the savings in man-hours achieved through the utilization of a classroom approach is the fact that it would lend itself more readily to controlled studies designed to examine the effects of reading instruction on pronunciation ability. The intent of this research then, was to examine a classroom based approach for teaching reading in the Spanish second language curriculum at the Language Training Mission.

Definition of Terms

To help the reader more clearly understand the author's terminology used in the context of this study, the following terms are defined:

1. Word Attack test--A test designed from the reading test used in Lectura Inicial. The test contains thirty words, generally multi-syllabic, composed mainly of a) sounds which correspond to different letters in Spanish than in English and b) unique sounds in Spanish. In that these items are nonsense words, this test is designed to measure a rater's judgment regarding the ability of a subject to pronounce words which he has to first decode.

2. Pimsleur Spanish Speaking Proficiency Test--A standardized test published by Harcourt, Brace and Janovich (1967). The pronunciation section of the test, which is used in this study, is designed to measure a rater's judgment regarding the proper pronunciation of specific Spanish constructions within the context of a sentence.
3. Rater--A person selected for his ability to speak Spanish (usually a native) who judges the ability of subjects to pronounce Spanish using a rating scale.
4. Lectura Inicial (Harrison, Ott and Tuttle, 1974)--A tutor's guide for teaching sounds and the blending or decoding skill in Spanish following a programmed sequence which specifies introduction of certain sounds and includes experiences with reading previously unencountered phonetic words. Wilkinson (1975) used Lectura Inicial as the instructional treatment for the subjects in the experimental group.
5. Classroom Reading Instruction (Guymon and Harrison, 1977)--A series of lessons for teaching two reading subskills, producing sounds and decoding, in the Spanish second language curriculum. A programmed sequence is followed which specifies introduction of certain sounds and includes experiences with reading previously unencountered words. The classroom reading model is comparable to Lectura Inicial in terms of the two reading subskills taught. The classroom reading model

is the treatment applied to the subjects in the experimental group of this study.

6. Phonetic reading--For the purposes of this study, phonetic reading is defined as the ability of a subject to decode words by blending the sounds in a word after referring to the written form of the word and without first receiving a verbal model of the word.

It is important to note that scholars in the field of reading (Woodcock, 1973; Harrison, 1974) consistently measure the decoding skill through the use of previously unencountered words (usually nonsense words) which are "regular" in their phonetic construction. ("Regular" in this sense means that there is a consistent correspondence between the written symbols and the sounds they stand for.) Both Lectura Inicial and the Classroom Reading Instruction utilize this same approach. When the decoding skill is taught as part of the second language experience, it can be thought of not only as reading instruction but also as a specific type of pronunciation instruction. For example, for an English speaker attempting to read the English nonsense word "branlemming" without first having a model of the word requires a knowledge of the individual sounds in the word and the ability to blend the sounds together. In like manner, for someone who is learning English, the correct pronunciation of

"branlemming" requires the same decoding skills. At the same time the second language learner's ability to decode "branlemming" provides a measure of his ability to actually pronounce the word. This analogy is just as applicable to the second language learner attempting to read Spanish nonsense words.

Hypotheses

Two null hypotheses were tested in this study:

1. The mean rating of pronunciation ability of the subjects in the experimental group (LTM missionaries receiving classroom reading instruction as well as the standard LTM grammar instruction) will not exceed the mean rating of the subjects in the control group (those receiving the standard LTM grammar instruction only) when the subjects are asked to determine the pronunciation of unfamiliar words (word-attack test).
2. The mean rating of pronunciation ability of the treated subjects will not exceed the mean rating of the subjects in the control group on the Pimsleur Spanish Speaking Proficiency Test.

It should be emphasized that the hypotheses tested in this study are representative of two of the hypotheses tested by Wilkinson (1975). The critical objective of this study was to validate a classroom model of Spanish second language reading instruction in an effort to achieve improved pronunciation ability as demonstrated by Wilkingon (1975) through using the tutorial-based Lectura Inicial. While the designers of the classroom

model gathered data of a formative nature to guide them in their development of the overall classroom Spanish model, specific data, particularly of a summative nature, focusing on the content of the reading instruction and the nature of the classroom model were not gathered. Inasmuch as the classroom reading lessons have demonstrated some merit through formative evaluation efforts and are now being considered for inclusion as part of the LTM Spanish curriculum, it seemed desirable to provide a measure of validation of the notion in general through a study based on experimental design.

Given that research does not substantiate a particular "best time" introduction of reading instruction into the Spanish second language curriculum, the author has selected for the purposes of this study the early introduction of reading instruction which is suggested by the traditional approach, as implemented by Wilkinson (1975) in an attempt to achieve similar results. Furthermore, to improve the internal and external validity of the study by controlling for such factors as history, and partially controlling for such factors as reactivity, and multiple treatment inference (Campbell and Stanley, 1963), it was decided to treat the subjects during their first week at the LTM. Missionaries receiving minimal exposure to the intensive instructional environment of the LTM would have less probability of being exposed to such factors. It was hypothesized by the author that the results obtained through using first week LTM missionaries in this study should confirm the significant results obtained by Wilkinson through using fourth and fifth week LTM missionaries, as supported by the traditional approach of early reading instruction in second language learning.

METHOD

Subjects

Members of the Language Training Mission staff were asked to identify a minimum of 32 missionaries (four districts of eight missionaries each) who had received no exposure to Spanish prior to entering the LTM. The screening procedures revealed the fact that approximately twenty percent of the missionaries called to serve in Spanish speaking missions have had no prior exposure to Spanish. This made it impossible to randomly assign missionaries to districts although missionaries enter the LTM generally on a random basis according to birthdate. The final screening identified 33 subjects having no background in Spanish who were assigned to four districts. The four districts were then randomly assigned to the experimental and control groups. To ensure the absence of prior Spanish experience required of the subjects for this study, the missionaries were given an additional ten item word-attach screening test to determine their ability to decode and pronounce previously unencountered Spanish words. The results of the screening test revealed that three missionaries from the control group evidenced some ability to read Spanish phonetically upon entering the LTM. Through evaluating a questionnaire which was designed to confirm the results of the initial LTM screening, it was found that the three subjects who evidenced ability to read Spanish phonetically on the word-attach screening test noted that they had studied Spanish intensively for the two month waiting period from the time they had received their missionary assignments to the time they were scheduled to report at the LTM. As a

result of the findings on the word-attack screening instrument, these three subjects were subsequently omitted from the data analysis.

Design

Two treatment conditions, control and experimental, were employed in the study. The subjects in the two districts comprising the control group received the classroom Spanish instruction currently used by the Language Training Mission, Español Para Misioneros (1974). This instruction does not systematically teach phonetic reading in Spanish although the missionaries interact with the written text beginning on their first day of instruction.

The subjects in the experimental group received the classroom reading lessons for two hours per day during their first week (six instructional days) at the LTM. The lessons were also reviewed for approximately 45 minutes each evening. For the remainder of each instructional day during the six-day instructional period, the missionaries in the two districts comprising the experimental group received the same LTM classroom Spanish instruction as the control group. To ensure a restricted treatment time for the experimental group, a separate instructor was used to teach only the classroom reading lessons. The instructor was trained to follow the classroom reading materials verbatim and was then monitored at various intervals in the duration of the treatment to guarantee strict adherence to the instructional materials.

Given the initial equivalency of the control and experimental groups, a posttest-only control group design was employed. Two precautionary measures were taken to ensure equivalency of subjects prior to receiving the treatments: 1) the subjects were initially selected on the basis of

having received no prior exposure to Spanish and 2) the subjects were given two subsequent screening instruments, a word-attack test and a questionnaire, to confirm the no-Spanish language exposure criterion. In addition, Modern Language Aptitude Test scores (MLAT) were available for all but two subjects (again in the control group) to serve as a measure of second language acquisition. (The MLAT is intended for completion by every prospective missionary prior to receiving their mission assignments.) In the case of the two subjects whose MLAT scores were not available, it is not known whether the missionaries did not complete the exam or if they completed the exam but their scores were not subsequently recorded.

Independent and Dependent Variables

The independent variable for this study was training meant to affect the missionary's ability to read Spanish phonetically. Phonetic reading was defined as the ability to correctly produce sounds in a word and blend (decode) the sounds together to read the word orally without first having an oral cue.

The dependent variable, pronunciation ability, was measured using two instruments: the word attack posttest and the Pronunciation Section of the Pimsleur Spanish Speaking Proficiency Exam. The word attack posttest was designed to include the words utilized on the decoding portion of the test accompanying Lectura Inicial. The subject's performance was recorded on tape and the scoring was accomplished using four raters. The Pronunciation Section of the Pimsleur Exam requires the subject to read twenty sentences. His/her performance is recorded on tape and subjected to scoring by several raters. The

raters score only two specified segments (sounds) of each sentence. In other words, an entire word or sentence is not considered for rating as in the word-attack posttest.

Data Collection

The same rating procedure was utilized for scoring both instruments. For the word-attack test, the subjects were taped as they read the thirty items. A special tape was then prepared according to the following procedures:

1. The subjects were given a number, selected from a random number table, and arranged on the tape numerically.
2. The first subject on the tape was selected a second time from the random number table. This was done to provide the raters one trial rating, although the raters were not informed as to such.
3. The above procedure was then repeated, including another random recording of the subjects on a second tape, so that each rater rated every subject twice.

Four persons were assigned by the LTM to serve as raters for this study. The raters were Spanish natives who were employed by the LTM as trained Foreign Service Institute (FSI) examiners. The raters were situated to avoid comparison of their ratings. They then scored each subject according to the stipulated rating scale.

The above procedure using the same tape preparation procedures and the same four raters, were implemented for collecting data on the pronunciation section of the Pimsleur Spanish Speaking Proficiency Exam.

Data Analysis

Analysis of co-variance techniques were employed through the use of the Modified Abbreviated Doolittle statistical program on the IBM 360 computer facility at Brigham Young University. The test for significance was made using a one way univariate analysis setting the level of significance at .05.

The terms in the model included a covariate and the three main effects of treatments, ratings and raters, as employed by Wilkinson (1975). All of the effects are considered fixed. The raters were considered fixed because they were trained ISI examiners employed by the LTM. The subject to subject differences were attributed to the error term.

The covariate used in the model was the subjects' Modern Language Aptitude Test (MLAT) scores. It was felt that the MLAT scores should be included in the model, providing it proved to be a significant factor and appropriate procedures were followed to assess homogeneity of slope.

Inter- and intra-rater reliability was measured using the effects of rater and ratings. The ratings effect was included as a measure of reliability within each rater (intra-rater) since each rater rated every subject twice. It was felt that a test of intra-rater reliability would provide some measure as to the ability of each rater to be consistent in his ratings.

The rater effect was included to provide a measure of the amount of agreement between raters (inter-rater reliability). In that Wilkinson (1975) found both the rater and ratings effects to be significant, the reliability of the instruments he used in his study are under question. However, Wilkinson (1975) states that given proper procedures for controlling the data

collection procedures of an instrument, the conclusions generated from an unreliable instrument, if significant, would be more difficult to achieve and even more conservative than those which could be made from reliable instrumentation. Suspecting low reliability of raters to surface in this study as it had previously surfaced in Wilkinson's study (1975), the more controlled tape preparation procedures (randomizing subjects on tape) were implemented for both the word-attack test and the Pimsleur Exam.

RESULTS

Word-Attack Test

The ability to read Spanish phonetically, including proper pronunciation, was defined as the ability of the student to decode previously unencountered Spanish words. This variable was measured by the word-attack test. An analysis of covariance was first examined to determine whether the MLAT scores would indeed serve as a significant covariate effect in the model. The analysis showed the MLAT to be a significant covariate effect ($F(1,209) = 46.68$, $p .001$). The covariate was then tested for heterogeneity of slope. Defining a conservative level of significance at .20 (if the level of

$p < .001$). The covariate was then tested for heterogeneity of slope. Defining a conservative level of significance at .20 (if the level of significance was .05, heterogeneity would still be suspect at .10, .15, etc), the covariate model was found to have a homogeneous slope with respect to all terms except treatments ($F(1,209) = 4.58$, $p < .05$).

Adjusting for the covariate and the covariate-treatment interaction, the following terms were also significant: treatment ($F(1,209) = 22.64$, $p < .001$) and rater ($F(3,209) = 5.04$, $p < .005$). The ratings effect and all other interactions were not statistically significant at a .05 level of significance.

The covariate-treatment interaction was broken down at two levels, the 10th percentile and the 90th percentile (.15 and .70 respectively) for further analysis. T-test analyses showed that the mean score of the experimental group significantly exceeded the mean score of the control group at both the 10th percentile ($T(209) = 5.63$, $p < .001$) and 90th percentile ($T(209) = 2.90$, $p < .005$) covariate levels. The means for the experimental and control groups at the 10th and 90th percentile covariate levels are respectively, 16.82, 9.58 and 21.37, 18.28.

Insert Table 1 about here

In other words, the subjects in the experimental group demonstrated a significantly better ability to decode previously unencountered

words. In addition, this difference was greater for experimental subjects of lower language aptitude than for control subjects.

Pimsleur Exam

The ability to pronounce Spanish was also measured by the pronunciation section of the Pimsleur Spanish Speaking Proficiency Exam. An analysis of covariance was first examined to determine whether the MLAT scores could serve as a significant covariate effect in the model. The analysis showed the MLAT to be a significant covariate effect ($F(1,209) = 35.73, p < .001$). The covariate was then tested for heterogeneity of slope. Defining a conservative level of significance at .20, the covariate model was found to have a homogeneous slope with respect to all terms except treatments ($F(1,209) = 4.53, p < .05$).

Adjusting for the covariate and the covariate treatment interaction, the following terms were also significant: treatment ($F(1,209) = 19.84, p < .001$) and raters ($F(3,209) = 63.00, p < .001$). The ratings effect and all other interactions were not statistically significant at a .05 level of significance.

The covariate-treatment interaction was broken down at two levels, the 10th and 90th percentiles (.15 and .70 respectively) for further analysis. A T-test showed that the mean score of the experimental group (28.03) significantly exceeded the mean score of the control group (22.15) at the 10th percentile covariate level ($T(209) = 5.12, p < .001$). The difference between mean scores of the two groups at the 90th percentile covariate level (31.15 and

29.40, respectively) was not quite significant statistically ($T(209) = 1.84, p < .07$).

Insert Table 2 about here

In other words, the experimental subjects of low-language aptitude performed significantly better than the low-language aptitude subjects in the control group on the pronunciation section of the Pimsleur Exam.

DISCUSSION

The analyses of the data support the rejection of the two null hypotheses tested in this study. An important result of the data analysis is the significant covariate-treatment interaction found with both instruments. A comparison of this interaction found for both instruments reveals a common trend--there is a more significant difference when comparing low-aptitude subjects of both groups than when comparing high-aptitude subjects.

Insert Figure 1

The presence of aptitude-treatment interactions is consistently supported in the literature (Cronbach and Snow, 1975, Wright, Note 8, Tobias, Note 9). The fact that there was a significant difference ($T(209) = 2.90, p < .005$) in subjects of higher ability on the word-attack test and a non-significant difference ($T(209) = 1.84, p < .07$) among the same high-aptitude subjects on the Pimsleur Exam can again be explained by examining the relative degree of reliability of both instruments. In other words, the instrument having

less variation due to raters (word-attack test) reveals a more sensitive difference among students of higher ability than the instrument having the greater variation due to rater (Pimsleur Exam).

Although the classroom model used in this study yielded a significant improvement of pronunciation ability among treated subjects, several limitations need to be considered to allow for generalization of the results of this study. An important consideration is the fact that only one teacher was used to teach the classroom reading lessons in the two districts comprising the experimental group. Since the classroom reading lessons provided verbatim explanations to be followed explicitly by the instructor, and the instructor was monitored to ensure complete adherence to the instructional model, the instructor is not considered a significant effect in this study. It was felt that an instructor other than the subjects' regular instructors should be utilized for this study to avoid the possibility of unintentionally increasing the time of reading instruction among subjects in the experimental group.

Another consideration in the formal validation of any instructional package is the nature of the training required of the disseminators (in this case, the instructor). Because the instructor used for this study was trained through verbal instructions, it could be argued that the training received by the instructor is a significant effect along with the instruction itself. Again, in that the instructional model provides the instructor verbatim explanations to give to the class, as well as directions for covering each instructional step in the model, it is hoped that the question of complete exportability of the instructional package is not critical to the

interpretation of the results in this study.

As stated previously, the major objection raised by supporters of the aural-oral approach to the early introduction of reading instruction in the second language curriculum is the purported tendency of the speaker to assign English sounds to the written orthography of Spanish. However, there has been little research conducted to determine exactly when reading should be taught (Wilkinson, 1975). Even supporters of the aural-oral approach (Stockwell and Bowen, 1965) suggest the early introduction of phonological training ("early" in this sense meaning once the student has acquired some conversational skills) recognizing the fact that the student is going to unquestionably form some kinds of pronunciation habits and unless they are correct habits they will have to be unlearned later. This would result in increased difficulty for the student and an inefficient use of teacher time.

Wilkinson (1975) argues that this objection raised by supporters of the aural-oral approach is perhaps based on the fact that heretofore, there has been no effective way to transmit the skills of correct identification and production of sounds and the ability to blend phonemes. He then suggests Lectura Inicial, which he validated in his study as a method for teaching these reading skills.

The results of this study suggest a classroom model as another alternative. The degree to which either Lectura Inicial or the classroom instruction employed in this study in fact transmit these skills is still not certain. In other words, given the subjects treated with the classroom instruction performed significantly better on the word-attack test than the subjects in the control group, their mean score on the instrument was only 18.9 out of

a possible 30. Similarly, on the Pimsleur Exam, results of this study confirm Wilkinson's findings that although the experimental group scored significantly better than the control group, their mean rating on the instrument was still only in the range of "poor" pronunciation, as defined by Pimsleur. A review of the instructions for the administration of the Pimsleur Spanish Speaking Proficiency Tests (1967) reveals the fact that to permit valid comparisons between the local group and the normative group, junior and senior high school students taking Form A of the test should have completed at least two-thirds of a first-level Spanish course as outlined in the textbook or instructional program used with the class. Clearly, the intensified Spanish program offered by the Language Training Mission is unique to the LTM and cannot be equated with any Spanish curricula offered at any grade level. Since the missionaries at the LTM are completely immersed in the Spanish language for approximately fourteen hours each day, a comparison to typical Spanish curricula seems futile. The LTM should compare pronunciation ability of its missionaries utilizing its missionaries as the normative group.

Another important issue relative to the thrust of this study and Wilkinson's is whether the effect of reading instruction on pronunciation ability in fact justifies its implementation into the Spanish curriculum. Such questions as: 1) What is the difference in pronunciation ability among missionaries treated with reading instruction early in the second language experience after their two month LTM experience? 2) What is the effect after one year in the mission field?, etc. need to be evaluated. In other words, the issue of when to provide reading instruction in relationship

to the short- and long-range effects on overall pronunciation ability need to be experimentally considered. In addition, the presence of aptitude-treatment interaction in this study suggests the experimental consideration of aptitude on treatment in conjunction with the above mentioned framework of the short- and long-range effects on overall pronunciation ability. The classroom instructional model examined in this study will provide a more useful foundation than a tutorial approach upon which to design future studies concerning these issues.

CONCLUSIONS

The study examined a classroom reading model and showed a significant difference in the ability of the model to teach the skills of producing sounds and blending. The classroom model was examined as an alternative to the tutorial approach. Furthermore, the acquisition of these reading skills showed a significant difference in the acquisition of pronunciation ability as measured by the pronunciation section of the Pimsleur Spanish Speaking Proficiency Exam and as measured by the ability to decode previously unencountered words.

The results of the study confirm the research conducted by Wilkinson (1975) regarding the improved effect on pronunciation ability of LTM Spanish missionaries due to early reading instruction. Furthermore, a significant aptitude-treatment interaction was found in the study, suggesting the need for the consideration of the presence of such an interaction in the evaluation of research.

Table 1

Estimated Means for Treatments
at 10th and 90th Percentile Covariate Levels
for Word-Attack Test

Covariate Level	Treatment Means		Diff.	Variance of Diff.
	Experimental	Control		
15*	16.82	9.58	7.24	1.65
70**	21.37	18.28	3.09	1.13

* $\bar{T}$ (209) = 5.63, $p < .001$

** $\bar{T}$ (209) = 2.90, $p < .005$

Table 2

Estimated Means for Treatments
at 10th and 90th Percentile Covariate Levels
for Pimsleur Exam (Pronunciation Section)

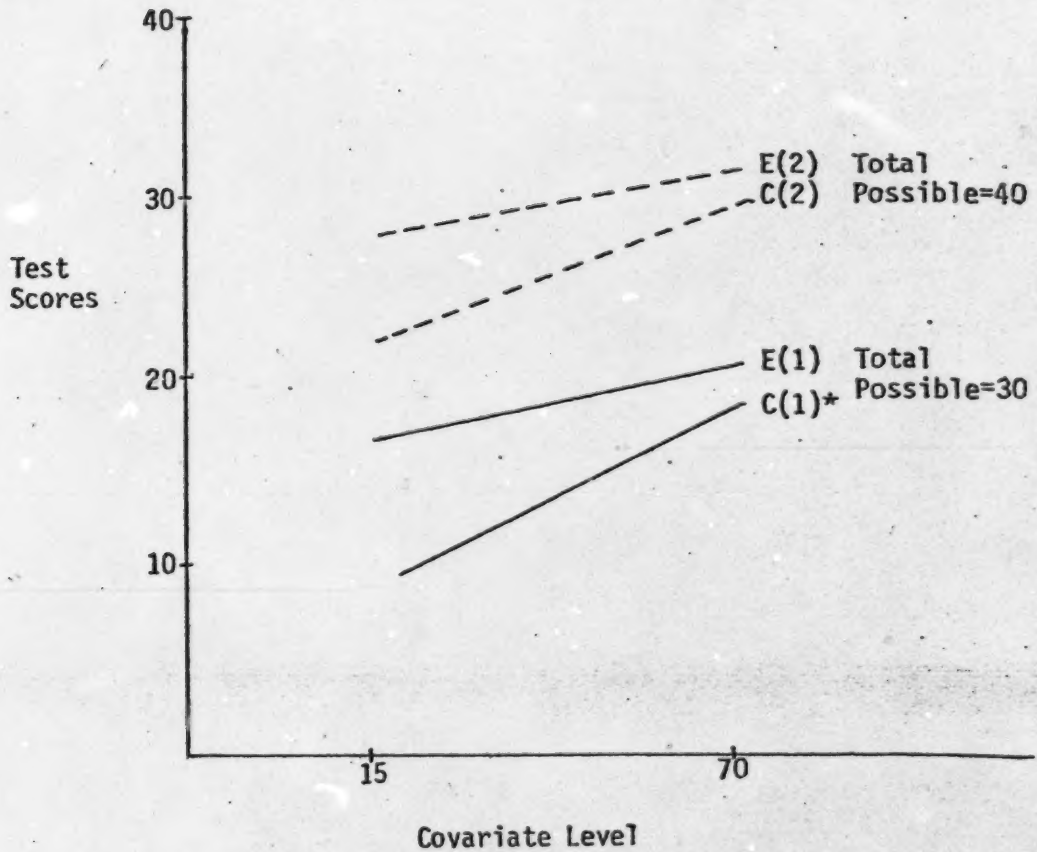
Covariate Level	Treatment Means		Diff.	Variance of Diff.
	Experimental	Control		
15*	28.03	22.15	5.88	1.32
70**	31.15	29.40	1.75	.90

* $\bar{T}$ (209) = 5.12, $p < .001$

** $\bar{T}$ (209) = 1.84, $p < .07$

Figure 1

Comparison of Covariate Treatment
Interaction for Both Instruments



*C(1) = Control group, Word-Attack Test

E(1) = Experimental group, Word-Attack Test

C(2) = Control group, Pimsleur Exam
(Pronunciation Section)

E(2) = Experimental Group, Pimsleur Exam
(Pronunciation Section)

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